IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANTS:	Yang Xu and Teresa Lechner-Fish	§	GROUP ART UNIT:	3753
SERIAL NO.:	09/538,455	§	EXAMINER:	A. Chambers
FILED:	October 9, 2001	§		
FOR:	Improved Stream Switching System	§		

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BOARD OF PATENT APPEALS AND INTERFERENCES
APPEAL BRIEF UNDER 37 C.F.R. 1.192

Box AF - Appeal Brief
Commissioner for Patents
Washington, D. C. 20231

Att'y. Docket No. 1787-06001
Date: September 16, 2002

Sir:

This paper is submitted as an appeal from the final rejection of independent claims 1, 9, and 13 dated June 4, 2002, pursuant to a Notice of Appeal filed September 3, 2002 along with the required appeal fee.

Real Party In Interest

The real party in interest is the Assignee: Daniel Industries, Inc., a division of Emerson Process Management.

Related Appeals And Interferences

No appeals or interferences are known to the Applicants, the Applicants' legal representative, or the Assignee which will directly affect or be directly affected by or have a bearing on the Examiner's decision.

Status of Claims

Originally filed claims: 1 – 17

Cancelled claims: 18, 19, and 22

Presently pending claims:	1-17, 20-21, and 23-30
Allowed claims:	none
Rejected claims:	1-17, 20-21, and 23-30
Claims objected to:	none

Summary of Invention

The comments below apply only to those claims that specifically recite the described features. Not all of the comments below apply to every appealed claim.

The invention is directed to an improved stream switching system. The improvements include combining flow restriction tubing at the output of a multi-input, common stream path housing (16/4)[1], the use of specialized solenoid to prevent gas and sample leaks during power failure (20/3) and special stream switching filter placement upstream of the stream switching housing (14/6).

In the field of gas chromatography, it is often necessary to sample the fluids flowing through a pipeline. (1/7). Those skilled in the art often employed a stream sampling system with a long distance between the sample point and the handling system. (2/1). For accurate measurement, the tubing would need to be flushed, introducing a significant lag time between samples. (2/5). Shortening the distance was unrealistic because the large handling system would then need to be continued in an expensive, explosion-proof housing. (2/12). In addition, prior handling systems often had a considerable amount of "dead volume" of sample inside the handling system itself, further slowing analysis since this dead volume of sample must similarly be purged between analyses.

[1] (16/4) refers to page 16, line 4 of the original patent application.

A new sample handling system was therefore developed. For the Board's convenience, Figure 7 of the application is reproduced below:

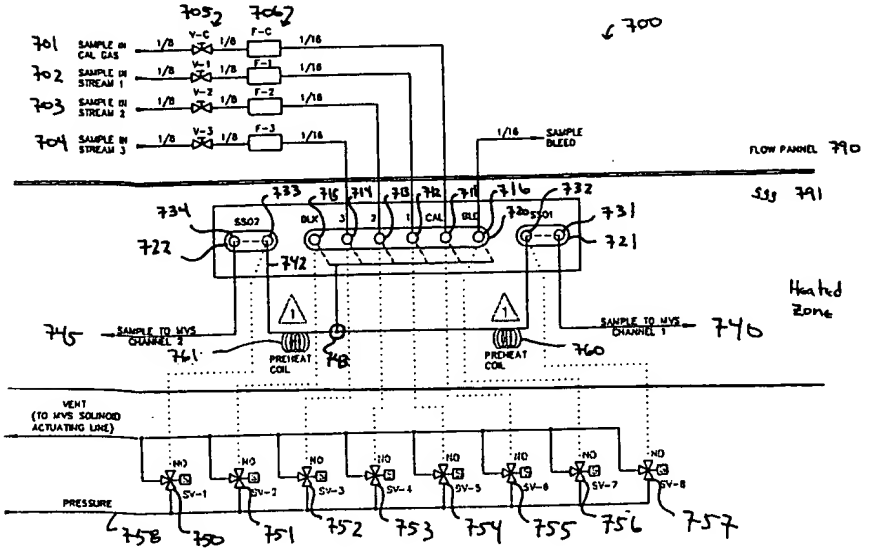


Figure 7

Referring now to Figure 7, stream switching system 700 includes a flow panel portion 790 upstream of sample wetted portion 791. (15/4). Flow panel portion includes inputs for calibration 701, stream 1 702, stream 2 703, and stream 3 704. (15/5). Streams 701-704 include respective valves 705 and respective particulate filters 706 along each stream's length prior to entry of the sample wetted portion of the stream switching system. (15/6).

Streams 701-704 supply various fluid samples to the sample wetted portion 791, and connect respectively to actuatable calibration port 711 and actuatable stream ports 712-714. (15/9). Actuatable ports 715-716 and 732-733, as well as ports 731 and 734, are also part of the sample wetted portion 791. (15/10). Each actuatable port may be actuated into either an open or closed state as controlled by eight connected solenoids 750-757 (SV1 - SV8) which correspond

respectively to ports 711-716, 732-733. (15/12). When a port is in an open state, fluid may pass freely through the port. (15/14). When a port is in a closed state, fluid is prevented from flowing through that port (15/14). Also shown in Figure 7 are solenoid pressure line 758 and solenoid vent line 759. (15/15).

Figure 7 shows a "double block and double bleed" stream switching system. (16/8). Each actuatable stream port 712-714, as well as actuatable calibration port 711, is positioned in an area 720 that creates a common sample path. (7/22). Also positioned in the common sample path 720 are an actuatable "blocking" port 715 and an actuatable "bleed" port 716. (7/23). In addition, area 721 creates a first sample shut off that contains two "blocking" ports 732 and 731. (8/2). Area 722 creates a second sample shut off that contains two "blocking" ports 733, and port 734. (8/3). As shown, ports 732 and 733 are actuatable, while ports 731 and 734 are not. (8/4). It is to be understood that all of these ports could be actuatable, or ports 731 and 734 could be actuatable while ports 732 and 733 are not. (8/5).

Two channels, channel 1 740 and channel 2 745, are output tubing that direct fluid sample away from the stream switching portion. (8/7). Each channel thus may be separately analyzed by a gas chromatograph. (8/11). Each channel can also be used as a flow path to "bleed" the system when switching from sample point to sample point. (8/12).

First and second sample shut off correspond to first and second channels 740, 745. (8/14). Consequently each channel is associated with two solenoids 750 and 757, either one of which can be actuated to prevent the flow of any fluid through the channel. (8/15). In the illustrated embodiment, the flow of fluid through channel 1 may be prevented by closing either actuatable blocking port 715 or actuatable port 732 in the first sample shut off. (8/18). Similarly, the flow of fluid through channel 2 may be prevented by closing either actuatable blocking port 715 or the

actuatable port 733 in the second sample shut off. (8/20). Thus, because the flow of fluid may be prevented through a channel at either of two locations, this is a "double block" design. (8/22). In addition, the system may be bled through sample bleed port 716. (8/23). Thus, because the system may be bled either through a channel or through the sample bleed port 716 the embodiment is a "double bleed" design. (9/1).

A first flow restrictor and pre-heat coil 760 is in association with coil 1, and a second flow restrictor and preheat coil 761 is in association with coil 2. (16/4). More specifically, in the pictured-embodiment first pre-heat coil 760 is located between "T" point 743 and the first sample shut off. Second pre-heat coil 761 is located between "T" point 743 and the second sample shut off. (16/6).

As sample flows through the respective flow restrictors and pre-heat coils 760, 761, the sample is heated. (16/9). This heating of the sample, if desired, accomplishes two goals. (16/10). First, the sample must preferably be introduced to the gas chromatograph as a single phase sample instead of a two-phase liquid/gas sample. (16/11). Temperatures above about 80 degrees Fahrenheit are normally adequate to maintain a gaseous sample of most hydrocarbon process streams at a sample pressure of 15-25 psi. (16/12). Second, an elevated temperature (preferably near the chromatograph temperature) for the sample is desirable for the optimal operation of the gas chromatograph. (16/14). Thus, the "pre-heating" of the sample helps to achieve a more accurate measurement of the sample's composition by the gas chromatograph. (16/15). Further, the pre-heat coil additionally acts as a restriction column to flow because of a small inner diameter. (16/17). By selecting the proper diameter tubing, the sample flow at the vent is reduced from an unobstructed 200-250 cc/minute at 15 psig inlet pressure to about 50-70 cc/min at 15 psig. (16/18). The

increased control over sample flow rate given by the pre-heat coil allows simultaneous analysis by gas chromatographs downstream to each coil. (16/20).

Prior Proceedings

In a non-final office action dated June 4, 2002, the Examiner rejected claims 1-8 under 35 U.S.C. § 112, second paragraph as indefinite, claims 1-12, 20, 21, and 23-30 under 35 U.S.C. § 102(e) as anticipated by *Higdon*, and claims 13-17 under 35 U.S.C. § 103(a) as obvious in view of *Higdon* and *Upchurch*.

35 U.S.C. 112, Second Paragraph

It is not clear to the Applicants whether the Examiner maintains his rejection of claims 1-8 under 35 U.S.C. § 112, second paragraph. In particular, the Examiner states:

> Claims 1-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention is with drawn in view of the amendment to claim 1 proving antecedent basis for "said flow restriction."

Thus, although the Examiner appears to withdraw his rejection under 35 U.S.C. § 112, second paragraph, Applicants will address this issue to err on the side of caution.

35 U.S.C. § 102(e)

Referring to the office action of June 4, 2002, with respect to the *Higdon* rejection of claim 1 and the claims that depend therefrom, the Examiner states:

> "Note the disclosure of a '...stream switching system...' for a chromatograph including a plurality of solenoid valves 98, a sheet heater (column 4, line 57+), and an insulated housing (Figure 3B, for example). Contrary to applicants previous remarks, the patent to *Higdon et al* clearly shows a common stream channel (single inlet/multiple outlet 72) valve by a particular solenoid 98. 'At least part of the tubing being pre-heated...' by the 'sheet heater' (column 4, lines 57+)(claims 1+). The solenoid actuated valves 98 clearly 'valve' the '...input and output ports...between an open and closed position.' (claim 9). The reduced 'tubing size' shown in Figure 3A (claim 18) acts as a restrictor. With regard to claims 19 and 20, note the plurality of input and outport ports (Figure 3A). No patentable weight has been given to the recitation added to claim 1 by the amendment filed August 14,

2001, in the 'restrictions' shown in Figure 1 of *Higdon et al* would be sufficient to restrict the sample flow to '...about 50-70 cc/min. With regard to claim 1, applicants' remarks of the Examiner's first assertion of the capability of the restricted flow path of Higdon to 'restrict a sample to about 50-70 cc/min is 'true' supports the Examiner's position that the 'restrictions shown in Figure 1 of Higdon et al would be sufficient to restrict the ample flow to about 50-70 cc/min' as recited in claim 1. The recitation of 'at 15 psig' has been deleted."

With respect to claim 9, the Examiner states:

"With regard to claim 9 remarks, claim 9 includes recitation that an 'outside impulse (is required) to place said actuable ports in the open position.' This recitation appears to be contrary to '..this forces the pistons into an upward position, resulting in closed ports' remarks in the amendment and the recitation of claim 9 is clearly readable on the solenoid valve 98 operation."

With respect to claim 13, the Examiner states:

"*Higdon et al.* disclose the claimed invention except for the recitation of a 'filter' as taught by *Upchurch* (Figure 1). The plurality of check valves (ball valves) act as pressure regulators." It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the chromatograph system of *Higdon et al* to include a 'cartridge filter' as taught by *Upchurch* in order to provide more 'pure' fluid to be tested and/or processed." Further in particular note the disclosure of a filter for the 'fluid streams' (column 6, lines 58+) of *Higdon et al.* Applicant's remarks, drawn to filter disposition, were considered, however, not deemed persuasive. In column 6, lines 58+ both outlet port filters and filters disposed in inlets are disclosed."

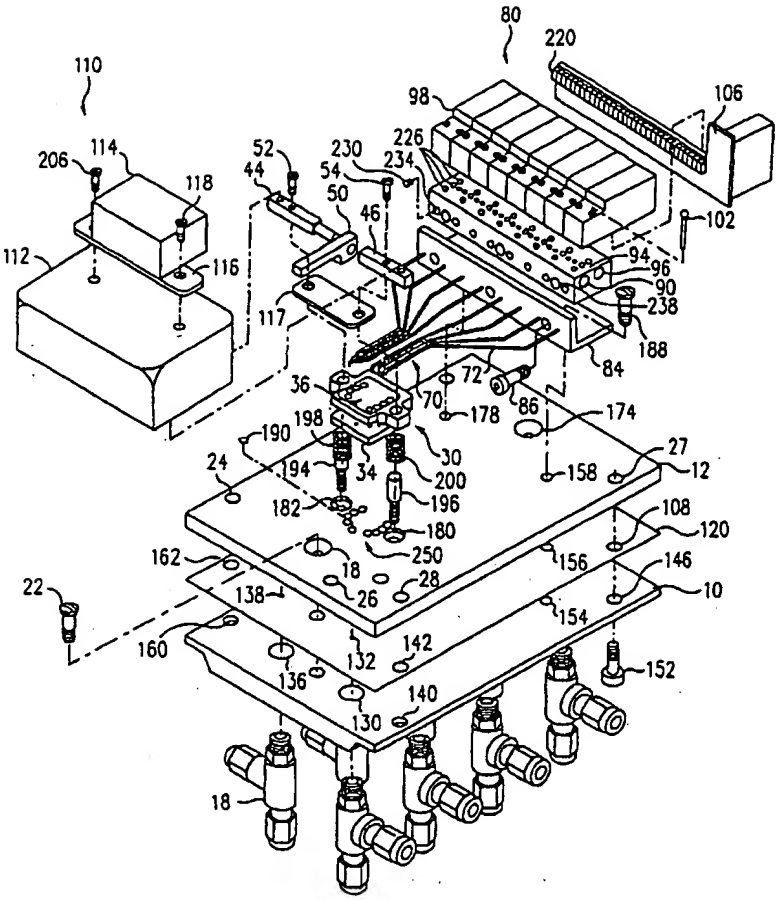


FIG. 2

U.S. Patent 6,102,068 (*Higdon*)

While the Board is encouraged to peruse *Higdon* fully, briefly *Higdon* teaches a selector valve assembly suitable to handle fluids in small quantities and direct them or select them, as is done with conventional valve assemblies. *See Higdon*, col. 3, l. 26. *Higdon* uses a micromachined valve body held in a releasable housing which, in turn, is mounted on a manifold plate to which are attached inlet and outlet fluid-carrying tubing. (Abstract of *Higdon*). The micromachined valve body is connected to a pilot valve assembly providing pneumatic operation of the micro-valves. *Id.*

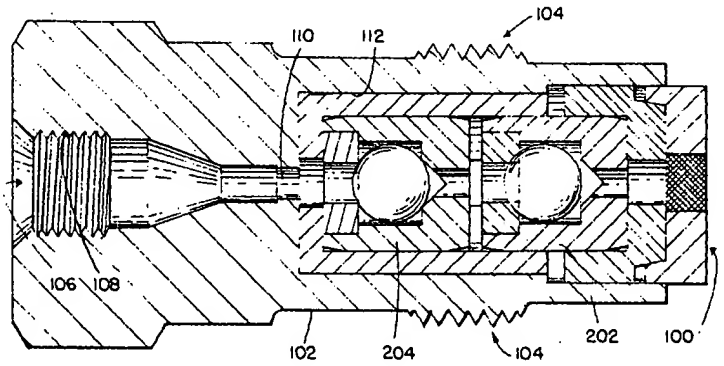
Higdon teaches a selector valve 34, with several inlets and a single outlet for selecting a particular fluid stream or combination of fluid streams. *Higdon*, col. 6, l. 49. The selector valve

34 is part of a valve assembly 30, which attaches to an upper plate 12. *Id.* at col. 3, l. 58. The upper manifold plate 12 defines a number of small diameter fluid carrying channels machined through and into it. *Id.* at col. 3, l. 52. The fluids from fittings 18 pass through the lower manifold plate 10 and through the upper manifold plate 12. *Id.* at col. 3, l. 54. Fluid outlet port 26 also connects to selector assembly 34. Also, a heater is mounted on the manifold plate. *See Id.* at col. 4, l. 66.

Communicating with the micromachined valve body 34 are several small diameter tubes collectively identified as 70, of which an example is tube 72. *Id.* at col. 4, l. 18. Tubes 70 are typical of the type used in small volume fluid handling systems; a typical internal diameter is 0.01 inches. *Id.* at col. 4, l. 22. Each tube 72 penetrates through a bracket 84 to valve manifold 94. Valve manifold includes a number of individual electrically controlled solenoid valves, of which only solenoid valve 98 is labeled. *Id.* at col. 4, l. 29.

Each of the inlet fittings 18 provides fluid to valve body 34 which in turn, by operation of the various pilot valves 98 determines which of these inlet ports 250 is in communication with the fluid outlet port or ports 26. *Id.* at col. 6, l. 45.

FIG. 1



U.S. Patent 4,846,218 (*Upchurch*)

Upchurch describes a check valve for liquid chromatography pumps. The check valve includes a disposable filter and regulates the flow of a mobilizing liquid in a pump of a liquid chromatograph. The end of the check valve includes an end seal that receives a filter mounted to be removable.

Issues

Are 1-12, 20, 21, and 23-30 properly rejected under 35 U.S.C. § 102(e) as anticipated by *Higdon*?

Are claims 13-17 under 35 U.S.C. § 103(a) as obvious in view of *Higdon* and *Upchurch*?

Grouping of Claims

Claims 1-8, 18-20, and 24 stand or fall together.

Claims 9-12 stand or fall together.

Claims 13-17 stand or fall together.

Claim 21 stands or falls alone.

Claim 23 stands or falls alone.

Claim 25 stands or falls alone.

Claim 26 stands or falls alone.

Claim 27 stands or falls alone.

Claims 28-30 stand or fall together.

Arguments

Applicants respectfully submit that the Examiner erred in rejecting claims 1-17, 20-21, and 23-30 because the Examiner has not adequately supported the rejection from knowledge generally available to one of ordinary skill in the art at the time the invention was made, established

scientific principles, or legal precedent established by prior case law. *Cf.* MPEP § 2144; *In re Fine*, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 21 USPQ2d 1941 (Fed. Cir. 1992); *Ex parte Clapp*, 227 USPQ 972 (Bd. Pat. App. & Int. 1985). In particular, Applicants respectfully contend that the 35 U.S.C. § 102 rejection is in error because *Higdon* does not teach what the Examiner asserts it does. Applicants also respectfully contend that the Examiner's 35 U.S.C. § 103 rejection is in error because *Upchurch* does not teach what the Examiner says it does, and even if the teaching of *Higdon* and *Upchurch* were combined, the combination would not teach the claimed invention.

I. THE REJECTION OF CLAIM 1 UNDER 35 U.S.C. § 112, SECOND PARAGRAPH

With respect to the rejection under 35 U.S.C. § 112, second paragraph an amendment to claim 1 was submitted by the Applicant that is believed to have overcome the rejection. Although the scope of claim 1 has not changed, clear antecedent basis has been provided for the term "flow restriction". In particular, claim 1 was amended to recite that the tubing is "to act as a flow restrictor for flow restriction of said fluid sample." This is believed to provide antecedent basis for "said flow restriction" later in claim 1. It is respectfully submitted that the Examiner's rejection under 35 U.S.C. § 112, second paragraph, if still in effect, is in error.

II. THE REJECTION OF CLAIM 1 UNDER 35 U.S.C. § 102(E)

The Examiner rejected claim 1 as anticipated under 35 U.S.C. § 102(e) by *Higdon et al.* Applicants respectfully submit that claim 1, and each claim dependent therefrom, is in condition for allowance. Claim 1, as it presently stands, recites:

1. A stream switching system, comprising:

a stream switching housing having at least one common stream channel portion with a plurality of input ports and at least one output port;

tubing connected at least one of said output ports,

said tubing at least in part being a pre-heat coil suitable to heat a fluid sample traveling through said coil and to act as a flow restrictor for flow restriction of said fluid sample, the extent of said flow restriction sufficient to restrict said sample flow to about 50-70 cc/min.

Referring to the disclosed embodiment, the recited tubing corresponds to the pre-heat coils 760, 761 shown in Figure 7.

Although the patentability of claim 1 must be judged on the claim as a whole, the Board is requested to note the following two differences between claim 1 and *Higdon*: (1) the recited tubing is connected to at least one of the *outlet* ports (not an inlet port); and (2) the restriction of sample flow to about 50-70 cc/min. Nowhere are these features shown or taught by *Higdon*.

Referring to the first point of distinction, the Examiner refers to column 4, lines 57 plus and Figure 3A for the teaching of tubing. The Examiner does not, however, allege that this tubing is connected to an output port that forms a part of a stream switching housing, as recited in claim 1. In fact, the tubes referred to by the Examiner are tubes 70, 72 which carry the sample from solenoids 98 to the *input* ports of sector valve 34 and do not connect to the *output* 26 of the selector valve 34. Thus, *Higdon* cannot anticipate claim 1 because *Higdon* does not disclose each and every feature recited in claim 1.

Referring to the second point of distinction, even if the tubing the Examiner refers to were attached to the output 26 of the selector valve 34 (although clearly it does not), there is no teaching or indication in *Higdon* that this tubing would restrict the sample flow in the claimed manner.

The Examiner states that the reduced tubing size shown in Figure 3A acts as a restrictor. The Examiner then asserts that the restrictions shown in Figure 1 of *Higdon* would be sufficient to

restrict the sample flow to "about 50-70 cc/min at 15 psig". Applicants respectfully submit that while, generally speaking, the Examiner's assertion that the tubes of *Higdon* do restrict the flow of fluid in some sense (*i.e.* the fluid does not to disperse freely), the Examiner's assertion that the flow would be restricted to about 50-70 cc/min is pure speculation and, in fact, can not be supported by the *Higdon* patent.

To anticipate a claim, each and every feature recited in the claim must be included in the device taught by the applied patent. Claim 1 requires that the fluid flow be limited to about 50 to about 70 cc's per minute. A careful perusal of *Higdon* reveals that the patent suggests typical tubing 70 with an internal diameter of 0.01 inches (again, an assumption must be made that this same size tubing would be used if tubing were connected to the output port 26 of *Higdon* instead of the *Higdon* input ports). *Higdon*, col. 4, ll. 22-23. Obviously, since no tubing is described as connecting to the output port, it is impossible to know the length of this speculative tubing. The pressure drop, therefore, across this tubing is unknown. *Higdon* does not explicitly teach the pressure drop across its tubing, and there is no way to determine from *Higdon* to what extent the gas flow will be limited.

Turning to the issue of inherency, to anticipate claim 1, the selector valve of *Higdon* must inherently provide tubing that satisfies the claim limitation. To inherently teach a feature, the feature must *necessarily* be present in the allegedly anticipatory device. Possibilities and probabilities are not enough. *See Continental Can Co. v. Monsanto Co.*, 948 F.2d 1264, 1269, 20 USPQ2d 1746, 1749 (Fed. Cir. 1991).

The *Higdon* patent does not necessarily teach tubing that restricts the sample flow to about 50-70 cc/min. Without knowledge of the length of the tubing of *Higdon*, it cannot be said that any

particular restriction will necessarily be achieved. Thus, for this additional reason, claim 1 is not anticipated by *Higdon.*

III. THE REJECTION OF CLAIMS 21 AND 23

The Examiner rejects claims 21 and 23 under 35 U.S.C. § 102(e) as anticipated by *Higdon.* Claims 21 and 23 read:

21. The stream switching system of claim 1, further comprising at least one sample shut off switch connected to a downstream end of said tubing.

23. The stream switching system of claim 21, wherein said sample shut off switch includes a bleed port.

As can be seen, claim 21 recites a sample shut off switch connected to the downstream end of the recited tubing (*see, e.g.*, areas 721 and 722 of instant Figure 7). Claim 23 recites that the sample shut off switch includes a bleed port.

As discussed above with respect to claim 1, *Higdon* fails to show or teach the tubing as claimed connected to an *output* port of a stream switching housing. *Higdon* also therefore fails to teach a sample shut off switch connected to the downstream end of the claimed tubing (claim 21), or that this sample shut off switch has a bleed port (claim 23).

IV. THE REJECTION OF CLAIM 9 UNDER 35 U.S.C. § 102(E)

The Examiner rejected claim 9 as anticipated under 35 U.S.C. § 102(e) by *Higdon et al.* Applicants respectfully submit that claim 9, and each claim dependent therefrom, is in condition for allowance. Claim 9 reads:

9. A stream switching system, comprising:

a stream switching housing having a common stream channel portion with a plurality of actuatable input ports and at least one actuatable output port, each of said ports

being actuatable between an open position permitting the flow of fluid through the port, and a closed position not permitting the flow of fluid through the port;

a plurality of fluid flow actuation switches associated with said actuatable ports, said fluid flow actuation switches controlling the placement of said actuatable ports between said open and closed positions, said fluid flow actuation switches requiring an outside impulse to place said actuatable ports in said open position.

As can be seen, claim 9 recites fluid flow actuation switches associated with the actuatable ports, the fluid flow actuation switches controlling the placement of the acuatable ports between open and closed positions, the fluid flow actuation switches requiring an outside impulse to place the actuatable ports in the open position. Applicants note with appreciation the Examiner's effort in observing that the recitation of claim 9 may be inconsistent with the argument presented in Applicant's response dated August 9, 2001. In particular, the Examiner notes on pages 3-4 of the office action that:

> With regard to claim 9 remarks, claim 9 includes recitation that an 'outside impulse (is required) to place said actuable ports in the open position'. This recitation appears to be contrary to '...this forces the pistons into an upward position, resulting in closed ports' remarks in the amendment..."

However, Applicants respectfully submit that the Examiner is mistaken.

Referring now to Figure 7, a series of solenoids 750-757 are shown. Actuation pressure line 758 is also shown. Constant pressure is supplied along actuation pressure line 758. With the use of prior art solenoids, power must be applied to the solenoids to shut off the pressure from line 758. In contrast, as disclosed at page 20 of the instant application, the preferred embodiment employs solenoids that are open when power is <u>not</u> applied, and hence allow the flow of actuation pressure when power is <u>not</u> applied. This is important in the context of the invention because upon

the application of actuation pressure, the inlet and outlet ports to the common stream channel close (see, *e.g.*, Figure 5), preventing leakage of sample upon power failure. Thus, when power is not applied the actuatable port is closed. Conversely, when power is applied, the solenoid is closed (preventing pressure from the actuation gas) so that the actuatable port is open, allowing the flow of fluid. It should be noted that, despite the fact that pistons are shown in Figure 5, the pistons themselves are not required for the use of solenoids in a default open position to be useful. As shown by *Higdon*, actuation ports may be constructed without the use of pistons.

Because *Higdon* does not teach fluid flow actuation switches requiring an outside impulse to place the actuatable ports in an open position, *Higdon* does not anticipate claim 9. Allowance of claim 9 is respectfully sought.

V. THE REJECTION OF CLAIM 13 UNDER 35 U.S.C. § 103

The Examiner rejected claim 13 as obvious under 35 U.S.C. § 103 in light of *Higdon et al.* and *Upchurch*. Applicants respectfully submit that claim 13, and each claim dependent therefrom, is in condition for allowance. Claim 13 reads:

13. A stream switching system, comprising:

a sample point location;

a stream switching portion;

tubing connecting said sample point location to said stream switching system portion;

one or more membrane or cartridge filters connected to said tubing and located proximate the sample point and between said sample point location and said stream switching portion.

In making his rejection, the Examiner stated:

> *Higdon* discloses the claimed invention except for the recitation of a 'filter' as taught by *Upchurch* (Figure 1). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the chromatograph system of *Higdon et al* to include a 'cartridge filter' as taught by *Upchurch* in order to provide

more 'pure' fluid to be tested and/or processed. Further in particular not the disclosure of a filter for the 'fluid streams' (column 6, lines 58+) of *Higdon et al.* Applicant's remarks, drawn to filter disposition, were considered, however, not deemed persuasive. In column 6, lines 58+ both outlet port filters and filters disposed in inlets are disclosed.

Applicants respectfully submit that the Examiner is mistaken. *Upchurch* teaches a check valve for liquid chromatography pumps. Included in this check valve is a clean filter 226 (col. 4, l 28). However, this alone does not render the invention of claim 13 unpatentable.

Claim 13 requires a sample point, a stream switching portion, tubing connecting the two, and one or more membrane or cartridge filters connected to the tubing and located proximate the sample point between the sample point and the stream switching location. Claim 14 specifies that the membrane or cartridge filters are within 10 feet of the sample point. Claim 15 specifies that the membrane or cartridge filters are within 3 feet of the sample point. As explained in the instant specification at p. 14, ll. 10-19, the placement of a filter as close as feasible to the sample point is advantageous. For example, the closer the filter is to the sample point, the lower the pressure needed in the overall system to force the sample through the filter. In addition, placement of the filter closer to the sample point, and the accompanying lower pressure necessary to operate the system, results in a longer life filter. Further, placement of the filter outside the stream switching system simplifies replacement and maintenance.

Applicants readily admit that filters are old in the art, and the mere inclusion of a filter in a gas chromatograph system is not what makes the claim patentable. Claim 13 recites not simply a filter, but one or more filters proximate the sample point and between the sample point location and the stream switching portion. Claim 14 specifies that the filter(s) are within 10 feet of the sample point. Claim 15 requires that the filter(s) be within 3 feet of the sample point. Claims 16 and 17 specify the location of a pressure regulation device with respect to the filter.

In contrast, *Higdon* teaches away from the claimed filter placement by teaching to place a filter in the outlet port 26. *Higdon*, col. 6, 1.60. As an initial matter, there is no motivation to combine *Higdon*, which already has a filter, with *Upchurch*. Further, even if the teachings of these patent were combined, they must be taken for all that they teach. For instance, *Upchurch* fails to teach or suggest a location for the filter. Thus, if *Higdon* and *Upchurch* were combined, then at most the filter of *Upchurch* would be placed at the outlet port 26 of *Higdon*. That is not what is claimed. Neither *Higdon* nor *Upchurch* teaches or suggests that the filter should be proximate the sample point between the sample point location and the stream switching portion, that the filter should be within 10 feet of the sample point, or that it should be within 3 feet of the sample point. Without these suggestions, the combination of *Higdon* and *Upchurch* can not make the claimed invention obvious: there is simply no suggestion in the cited prior art that benefits can be derived by placement of a filter between the sample point and the sample handling portion proximate the sampling point. Applicants respectfully submit that the Examiner has failed to make a *prima facie* case of obviousness and therefore requests allowance of the claims.

VI. THE REJECTION OF CLAIM 25 AS ANTICIPATED UNDER 35 U.S.C. § 102(E)

The Examiner rejects claim 25 as anticipated under 35 U.S.C. § 102(e) by *Higdon*. However, *Higdon* fails to teach at least one of the claimed features.

Claim 25 recites:

25. A stream switching system, comprising:

a housing with entrance holes and exit holes;

means for selecting which of a plurality of gas samples enter said housing;

means for heating said gas samples after said gas samples have entered said housing.

The Board's attention is directed to the limitation of claim 25 that requires means for heating gas samples after the gas samples have entered the recited housing with entrance holes and exit holes. As an initial matter, the Examiner fails to indicate where *Higdon* shows heating of a fluid sample after the sample has entered such a housing (assumedly selector valve 34). Secondly, the limitation is drafted in means-plus-function format, invoking the sixth paragraph of 35 U.S.C. § 112. The Examiner has failed to assert or allege that any heating of the sample of *Higdon* after entering selector valve 34 corresponds to structure disclosed in the instant patent application, or equivalents. Simply put, *Higdon* does not show the required heating of a fluid sample after entering a housing. *Higdon* can not anticipates claim 25.

VII. THE REJECTION OF CLAIMS 26 AND 27 UNDER 35 U.S.C. § 102(E)

The Examiner rejects claims 26 and 27 as anticipated under 35 U.S.C. § 102(e) by *Higdon.* However, as explained below, *Higdon* does not teach each and every limitation recited in these claims.

Claim 26 recites a housing with input ports and output ports, with piping connected to at least one of the output ports, the piping heating the gas samples to about a predetermined temperature. As explained in reference to claim 1, *Higdon* does not show or teach piping connected to an output port, and in particular does not show such piping heating gas sample to a predetermined temperature. Although *Higdon* teaches a sheet heater for the warming of fluid sample, there is no indication in *Higdon* that piping connected to the output 26 of the selector valve 34 plays any role in the warming of the fluid sample.

Claim 27 recites that the housing forms a sample shut off channel with an external bleed port, where the piping is upstream of the sample shut off channel. *Higdon* fails to teach or suggest a housing (corresponding to selector valve 34) that forms a sample shut off channel in addition to

the recited input ports, interior flow channel, and output ports. *Higdon* also fails to teach or suggest piping connected to an output port and upstream of a simple shut off channel. Consequently, *Higdon* cannot anticipate claim 27.

VIII. THE REJECTION OF CLAIM 28 UNDER 35 U.S.C. § 102(E)

The Examiner rejects claim 28 as anticipated under 35 U.S.C. § 102(e) by *Higdon*. However, as explained below, *Higdon* does not teach each and every limitation recited in claim 28.

Claim 28 recites a stream switching system having a housing, tubing, insulation around the housing and tubing, and a heater to warm the housing and tubing to a predetermined temperature, where the tubing acts as a flow restrictor to heat a fluid sample having a liquid portion to a predetermined temperature and where the tubing corrects to an output port of the housing. As disclosed at page 16 of the specification, this flow restriction and subsequent heating of the fluid sample ensures that it enters a gas chromatograph in the gaseous phase. Claim 29 specifies that this temperature is about 80 degrees. Claim 30 requires that the predetermined temperature be approximately the same as the gas chromatograph temperature.

The shortcomings of the Examiner's rejection with respect to claim 1 apply once again to claim 28. In particular, *Higdon* fails to show tubing connected to an output port, that tubing being adequate to heat a fluid sample to a predetermined temperature. *Higdon* also fails to show insulation that would surround tubing *connected to an output port*, as recited by claim 28. *Higdon* simply does not anticipate claim 28.

IX. CONCLUSION

Applicants respectfully request allowance of all the claims.

Respectfully submitted,

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